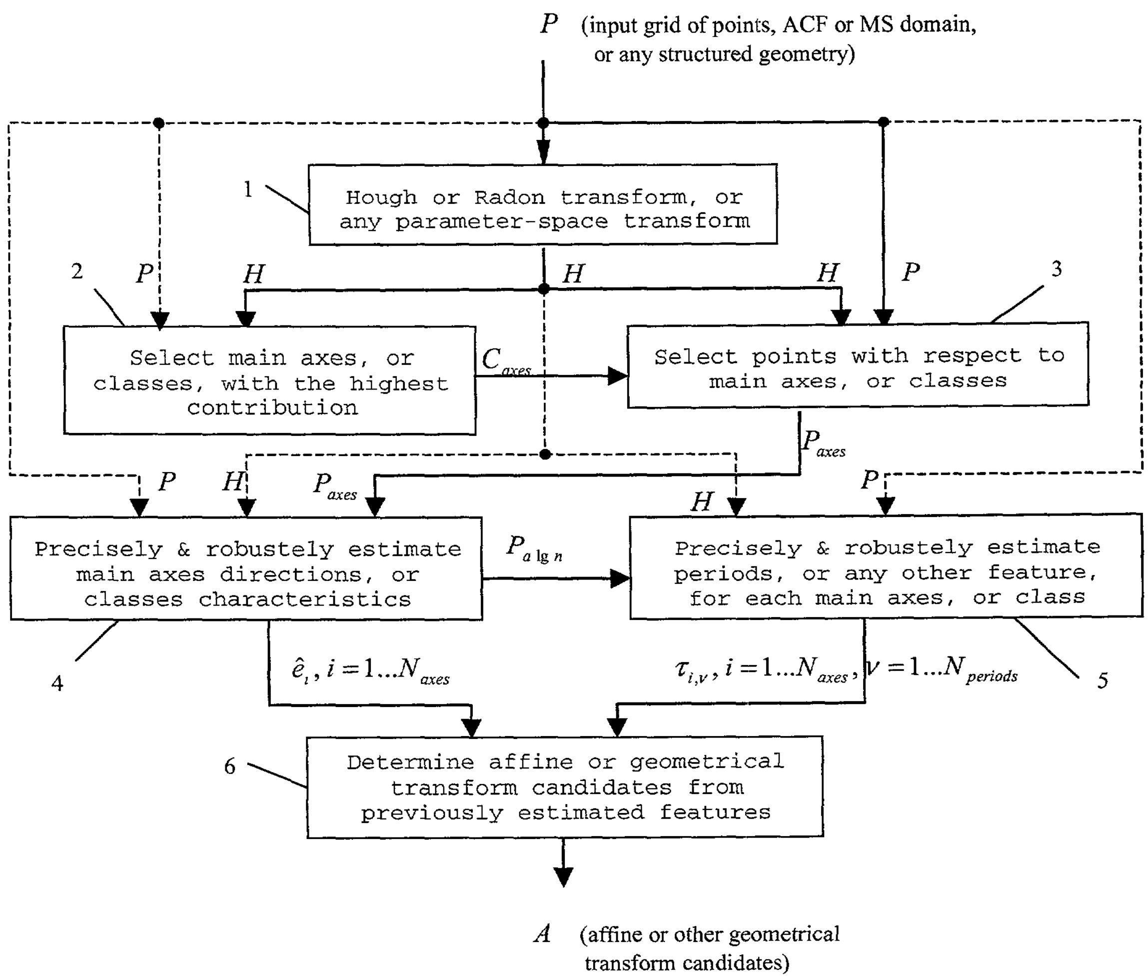
P (input grid of points, ACF or MS domain, or any structured geometry)
1
Hough or Radon transform, or any parameter-space transform
2
P
H
H
H
P
3
Select main axes, or classes, with the highest contribution
C_{axes}
Select points with respect to main axes, or classes
P_{axes}
P
H
P_{axes}
H
P
Precisely & robustely estimate main axes directions, or classes characteristics
$P_{a\lg n}$
Precisely & robustely estimate periods, or any other feature, for each main axes, or class
4
$\hat{e}_i, i = 1 \ldots N_{axes}$
$\tau_{i,v}, i = 1 \ldots N_{axes}, v = 1 \ldots N_{periods}$
5
6
Determine affine or geometrical transform candidates from previously estimated features
A (affine or other geometrical transform candidates)

FIG. 1

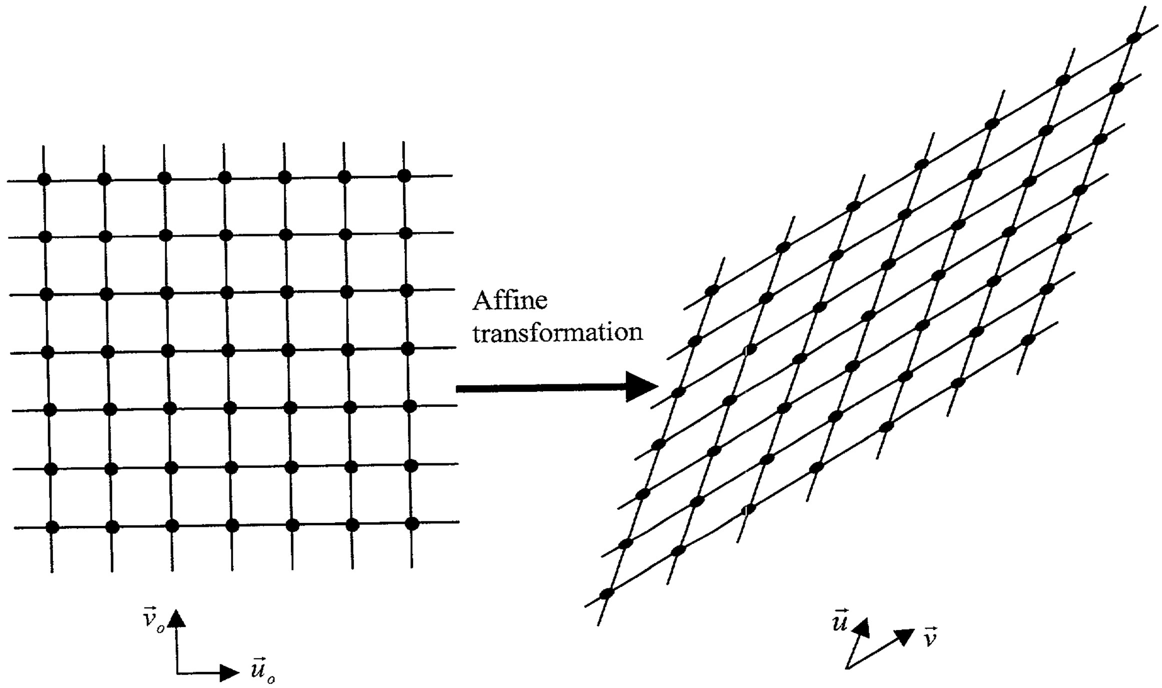

FIG. 2A. Reference grid structure.

FIG. 2B. Affine-transformed grid.

FIG. 2

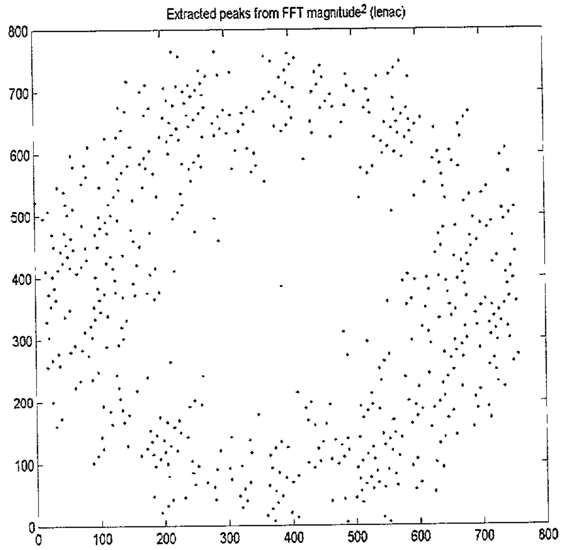

FIG. 3A. Noisy extracted points P after affine transform (e.g.: a rotation).

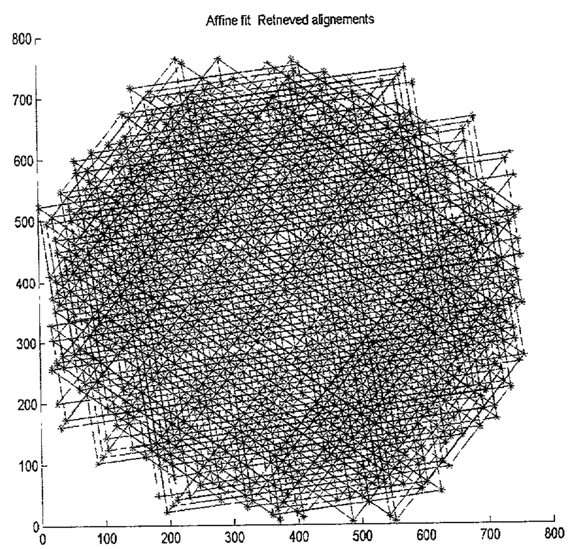

FIG. 3B. Fitted lines to the grid of points (here the 2 main directions, plus the 2 diagonals are represented).

FIG. 3

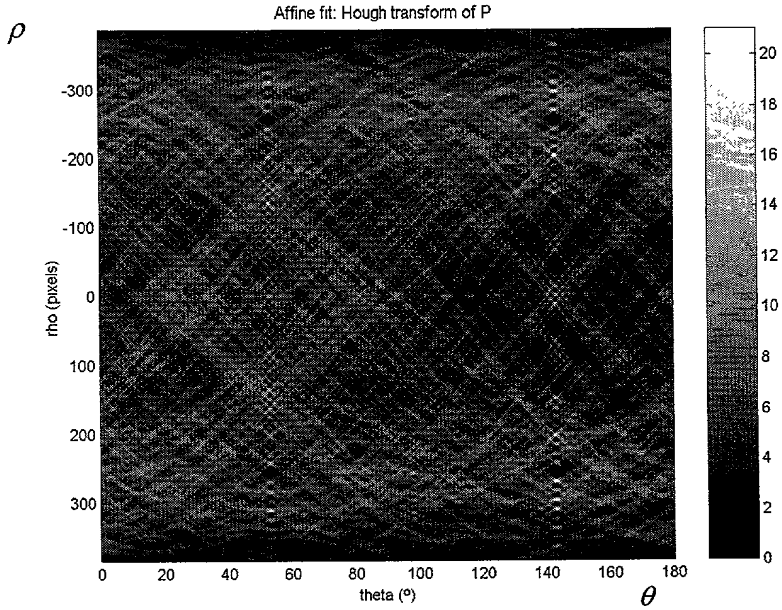

FIG. 4A. Hough transform H computed from P, resulting from the ACF or MS of the input data; the horizontal axis (θ) is the angle of projection, the vertical axis is the distance of projection (ρ), and the gray-level scale on the right stands for the number of projected points.

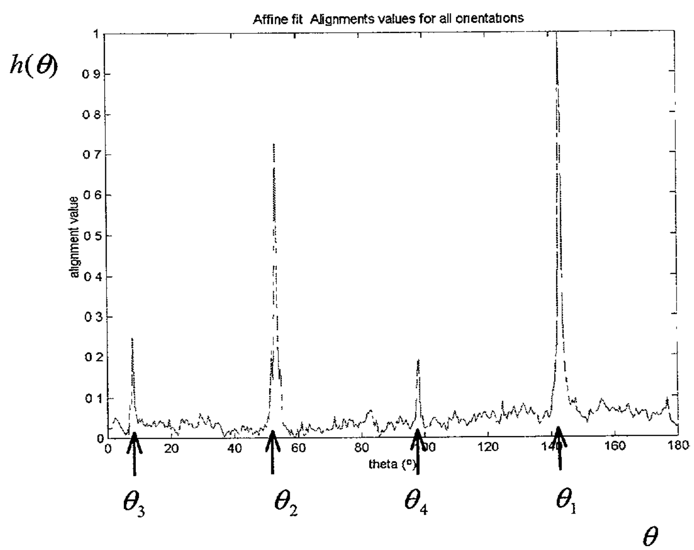

FIG. 4B. Estimation of the main angles of projection, the curve beeing any alignment contribution function $h(\theta)$ of the angle of projection; peaks correspond to alignements angles: θ_1 and θ_2 are the main axes angles, and θ_3, θ_4 2 diagonals.

FIG. 4

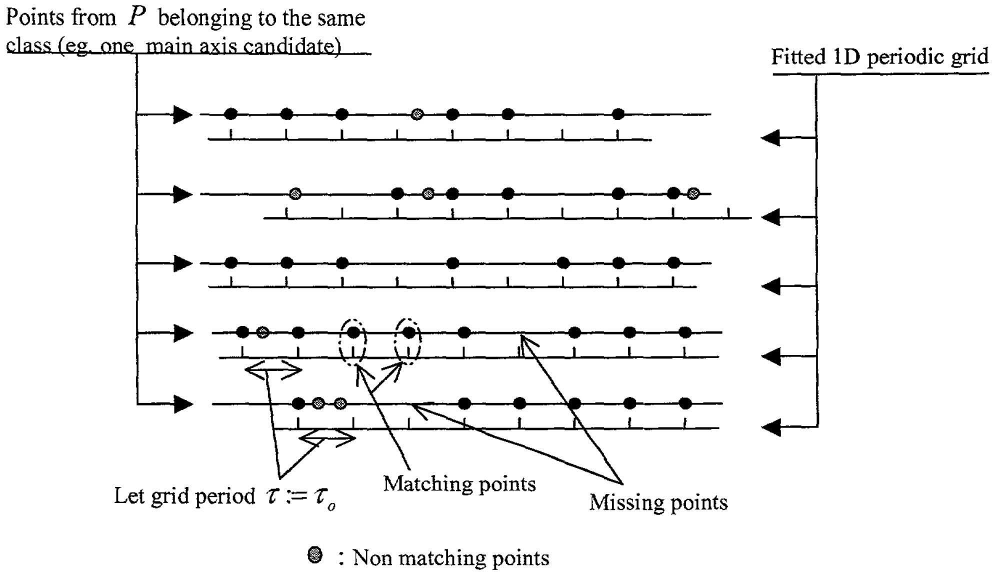

FIG. 5A. Idea of a matching function $M(\tau)$ of a period τ, given a noisy set of extracted points belonging to the same main axis (therefore on parallel alignments); the figure shows the case of $M(\tau_0)$, where τ_0 is the correct period: the idea is to count points which match with the fitted 1D grid.

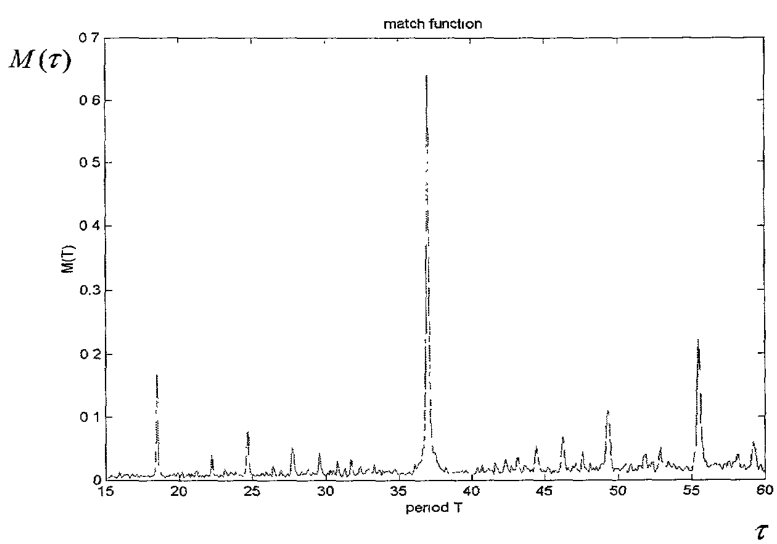

FIG. 5B. Plot sample of such a matching function, $M(\tau)$ showing the largest peak when $\tau = \tau_o$; here $\tau_o = 36$.

FIG. 5